Catalogue of American Amphibians and Reptiles.

Seidel, M.E. 2010. *Trachemys nebulosa*.

Trachemys nebulosa (Van Denburgh) Northwestern Mexican Slider

Pseudemys ornata: Yarrow 1882:33.
Chrysemys nebulosa Van Denburgh 1895:84. Type-locality, "Los Dolores… Mainland abreast of San Jose Island, Lower California, [Mexico]". Holotype, California Academy of Sciences (CAS) 2244, collected by W.E. Bryant in 1889, date unknown (not examined by author). See **Comment**.
Chrysemys ornata: Siebenrock 1909:466 (part).
Pseudemys nebulosa: Van Denburgh and Slevin 1921:53.
Clemmys marmorata: Linsdale 1932:385 (part).
Pseudemys scripta: Carr 1938:135 (part).
Chrysemys concinna: Wermuth and Mertens 1961: 140 (part).
Chrysemys scripta: Smith and Taylor 1966:12 (part).
Chrysemys gaigeae: Weaver and Rose 1967:63 (part).
Trachemys scripta: Iverson 1985:4 (part).
Trachemys dorbigni: Obst *in* Wermuth and Mertens 1996:473 (part).
Trachemys ornata: Walls 1996:50 (part).
Trachemys nebulosa: Wilms *in* Siebenrock 1999:198. First use of present combination.

• **CONTENT.** Two subspecies are recognized: *Trachemys nebulosa nebulosa* and *T. n. hiltoni*. See **Comment**.

• **DEFINITION.** The carapace of the adult female ranges to 37 cm and that of the male to 33 cm. It is widest at the level of marginal scutes 7–8. The carapace is oval, weakly keeled down the dorsal midline, and not notched or only slightly serrate along the posterior margin. The pleural scutes often have a series of rounded longitudinal ridges. The ground color of the adult carapace is brown to olive with obscured, black-bordered, orange reticulations along the pleural scutes, appearing as distorted "ocelli". The cervical scute underlap (ventral surface) is shallow, ventral length/carapace length < 0.035. The lateral and posterior marginals have dark spots or smudges on the dorsal and ventral surfaces. Markings of hatchlings and juveniles are more prominent.

The large, hingeless, plastron is relatively flat and slightly broader anterior to the bridge. The ground color of the plastron is pale to bright yellow with 2 rows of elongate black (smudge-like) markings variably separated by yellow at the midline. Elongate dark smudges also occur on the bridge.

The head and limbs are olive brown with a variety of yellow stripes. The supratemporal (postorbital) stripe is orange and does not contact the orbit of the eye. A yellow vertical bar branches dorsally from the orbitocervical stripe and crosses the tympanum. The throat is pale yellow, mostly without dark markings or clearly defined stripes. The left and right aspects of



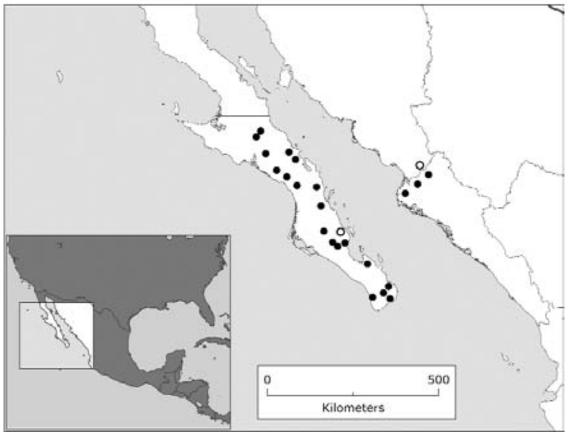
FIGURE 1. Juvenile *T. nebulosa nebulosa* from El Corro, Baja California Sur, Mexico (photograph by L. Grismer).



FIGURE 2. Head and plastral views of adult female *T. nebulosa hiltoni* from Río Cuchujaqui, Sonora, Mexico (photographs by C. Schwalbe).

the upper jaw form an acute angle where they join at the midline. The tomial edge of the mandible is not distinctly serrate and choanal papillae are present in the roof of the mouth.

In contrast to females, adult males have a longer and wider tail with the vent positioned beyond the posterior edge of the carapace. The snout of males is longer and narrower than in females, but there is no



Map. Circles mark type-localities; dots indicate other records.

marked sexual difference in foreclaw length.

• DESCRIPTIONS. General descriptions are presented in Bogert and Oliver (1945), Bonin et al. (1996, 2006), Bour (2003), Carr (1942, 1952), Casas Andreu (1965, 1967), Ernst (1990), Ernst and Barbour (1989), Ernst et al. (2000), Grismer (2002), Legler (1990), Legler and Webb (1970), Obst (1985), Pritchard (1967, 1979), Rogner (1995), Seidel (2002), Siebenrock (1909), Smith and Smith (1980), Smith and Taylor (1966), and Van Denburgh (1922). Other descriptions include: **head pattern** (Legler 1990; Ward 1980), **plastron pattern** (Williams 1956), **skull** (Ward 1980), **choanae** (Parsons 1960), **rostral pores** (Winokur and Legler 1974), **sexual dimorphism** (Gibbons and Lovich 1990), **egg** (Carr 1942), **habitat** (Carr 1952; Grismer 2002; Grismer and McGuire 1993; Hardy and McDiarmid 1969; Pritchard 1979), and **reproduction and nesting site** (Grismer 2002; Hardy and McDiarmid 1969).

• ILLUSTRATIONS. Black-and-white drawings are in Smith and Smith (1980), Van Denburgh (1895), Ward (1980), and Williams (1956). Black-and-white photographs are in Carr (1942) and Smith and Smith (1980). Color photographs are in Grismer (2002), Pritchard (1979), Rogner (1995), and Vetter (2004). Drawings of the egg are in Carr (1942) and of the plastron in Williams (1956). A color drawing of a hatchling is in Bour (2003).

• DISTRIBUTION. *Trachemys nebulosa* occurs in Mexico in disjunct bodies of fresh water in the southern half of the Baja Peninsula, Baja California Sur, and on the Mexican mainland, where it is restricted to the Río Fuerte drainage system of southern Sonora and northern Sinaloa. Range maps or discussions of the distribution of *T. nebulosa* are presented in Bonin et al. (1996, 2006), Bringsøe (2001), Carr (1952), Ernst (1990), Grismer (2002), Hardy and McDiarmid (1969), Iverson (1986, 1992), Legler (1990), Leviton and Banta (1964), Moll and Legler (1971), Mosauer (1935), Obst (1985), Roberts (1982), Seidel (2002), Smith and Smith (1980), and Vetter (2004). The subspecies *Trachemys nebulosa nebulosa* is restricted to Baja California Sur, Mexico, south of San Ignacio; the distribution of *Trachemys nebulosa hiltoni* encompasses the watershed of the Río Fuerte in extreme southern Sonora and northern Sinaloa.

Conant (1969) and Murphy (1983) suggested that *T. n. nebulosa* on the Baja Peninsula may have been introduced, presumably from an ancestral population in the Río Fuerte (Smith and Smith 1980). Grismer and McGuire (1993) speculated that most of the populations north of the Cape Region of extreme southern Baja are the result of human introduction. Zweifel and Norris (1955) erroneously extended the range of *T. n. hiltoni* 160 km northwest of the Río Fuerte. They based this on a slider turtle they collected in the Río Yaqui, Sonora, Mexico. That specimen (MVZ 55384, now apparently lost) probably was *T. yaquia*, subsequently described by Legler and Webb (1970).

• FOSSIL RECORD. No fossils have been reported. A Recent archeological record was reported from the west coast of Mexico (Voorhies et al. 2002).

• PERTINENT LITERATURE. General accounts are in Bonin et al. (1996, 2006), Carr (1952), Casas Andreu (1967), Ditmars (1907, 1936), Ernst et al. (2000), Grismer (2002), Nietzke (1969), Obst (1985), Pritchard (1979), Rogner (1995), Smith and Smith (1980), and Wermuth and Mertens (1961). Other important references include: **biogeography** (Clavigero 1789; Grismer 2002; Legler 1990; Savage 1960; Smith and Smith 1980), **common name** (Bogert and Oliver 1945; Liner 1994, 2007), **habitat and distribution** (Bogert and Oliver 1945; Bonin et al. 1996; Casas Andreu 1965; Hoard 1964; Mocquard 1899; Neill 1958; Nelson 1922; Roberts 1982; Savage 1960; Schmidt 1922; Smith and Smith 1975; Van Denburgh 1922), **human exploitation** (Grismer 2002), **longevity** (Bowler 1977; Snider and Bowler 1992), **macrosympatry** (Moll and Moll 2004), **morphology** (Parsons 1960; Winokur and Legler 1974), **natural history** (Bogert and Oliver 1945; Casas Andreu 1965; Grismer 2002; Zweifel and Norris 1955), **nesting behavior** (Carr 1952; Grismer 2002), **systematics and taxonomy** (Bickham et al. 2007; Bour 2003; Carr 1942; David 1994; Ernst 1990; Fritz 1981, 1990; Fritz and Havas 2007; Iverson 1986, 1992; Iverson et al. 2007; Legler 1990; Legler and Webb 1970; Obst 1985; Rust 1934; Seidel 2002; Smith and Smith 1980; Stephens and Wiens 2003; Van Denburgh 1895; Van Denburgh and Slevin 1921; Ward 1980; Weaver and Rose 1967; Wermuth and Mertens 1977; Williams 1956), **conservation** (Roberts 1982; Smith and Smith 1980), and **zoo holdings** (Nietzke 1969; Slavens 1976).

• ETYMOLOGY. The specific name *nebulosa*, from the Latin for “cloudy”, “misty”, “dark”, or “indefinite”, apparently refers to the obscured dark “ocelli-like” markings on the pleural scutes of the carapace. The subspecific name *hiltoni* is a Latinized patronym hon-

oring John W. Hilton, collector of the type-series.

1. *Trachemys nebulosa nebulosa* (Van Denburgh) Baja California Slider

Chrysemys nebulosa Van Denburgh 1895:84. See species synonymy.
Chrysemys scripta elegans: Mocquard 1899:300 (part).
Chrysemys ornata nebulosa: Siebenrock 1909:466.
Pseudemys ornata nebulosa: Stejneger and Barbour 1917:120.
Pseudemys nebulosa: Van Denburgh and Slevin 1921:53.
Pseudemys scripta nebulosa: Carr 1942:1
Chrysemys scripta nebulosa: Smith and Taylor 1966: 12.
Trachemys scripta nebulosa: Iverson 1985:4.
Chrysemys gaigeae nebulosa: Obst 1985:7.
Trachemys dorbigni nebulosa: Obst *in* Wermuth and Mertens 1996:473.
Trachemys ornata nebulosa: Walls 1996:50.
Trachemys nebulosa: Wilms *in* Siebenrock 1999:198.
Trachemys nebulosa nebulosa: Bringsøe 2001:520. First use of present combination.

• **DEFINITION.** Maximum carapace length is greater than 32 cm. The two rows of dark smudges on the plastron are distinctly separated by a yellow midline region. The pygal bone typically extends beyond the marginal-vertebral seam.

2. *Trachemys nebulosa hiltoni* (Carr) Río Fuerte Slider

Pseudemys scripta hiltoni Carr 1942:1. Type-locality, "…Guirocoba about 28 miles southeast of Alamos, Sonora, Mexico, at an elevation of approximately 1,485 feet." Holotype, American Museum of Natural History (AMNH) 63747, fluid preserved mature male, collected by John W. Hilton in 1941 (examined by author).
Pseudemys concinna hiltoni: Wermuth and Mertens 1961:140.
Chrysemys scripta hiltoni: Smith and Taylor 1966:11.
Chrysemys gaigeae hiltoni: Weaver and Rose 1967: 70.
Trachemys scripta hiltoni: Iverson 1985:4.
T*rachemys ornata hiltoni*: Walls1996:50.
Trachemys nebulosa hiltoni: Bringsøe 2001:520. First use of present combination.

• **DEFINITION.** Maximum carapace length is less than 32 cm. The two rows of dark smudges on the plastron are frequently connected along the midline. The pygal bone does not extend beyond the marginal-vertebral seam.

• **COMMENT.** The first apparent reference to this turtle was by Yarrow (1882:33) who lists USNM 11622, shell, as *Pseudemys ornata* Gray, 1831, collected in February 1882 by Lyman Belding at La Paz, Baja California Sur, Mexico. The locality was corrected to the San Jose River by Belding (1887:97).

Smith and Smith (1980) indicate that the type-specimen of *T. n. nebulosa* was "destroyed". The existence of the holotype (2244) in the California Academy of Sciences collection was recently confirmed by Robert Drewes and Jens Vindum (pers. comm.). Apparently Smith and Smith (1980) confused the holotype with CAS 2245 (a topotype also collected by W.E. Bryant) which was indeed lost in the earthquake and fire of 1906.

Trachemys n. hiltoni and *T. n. nebulosa* were formerly recognized as subspecies of *T. scripta*. Based on a phylogenetic analysis using morphological characters, Seidel (2002) found that these turtles are very similar (sister taxa) and assigned them to subspecies of *T. nebulosa*. Their phylogenetic relationship and natural origins remains somewhat uncertain (Legler 1990; Smith and Smith 1980).

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